Cryptologic Systems Group

"Securing the Global Information Grid (GIG)"

Core System Engineering Processes for AF Systems Engineering Assessment Model (AF SEAM)

Briefer: Bill Fetech
Office Symbol: CPSG/EN (MITRE)
Phone: 210-925-1086; DSN 945-1086
E-Mail: William.Fetech.ffrdc@Lackland.AF.Mil

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Agenda

- Cryptologic Systems Group (CPSG)
- AF SEAM Overview
- Electronic Systems Group (ESC) Guidance
- CPSG AF SEAM Implementation
- CPSG AF SEAM Compliance
- CPSG Training

Agenda

- **Cryptologic Systems Group (CPSG)**
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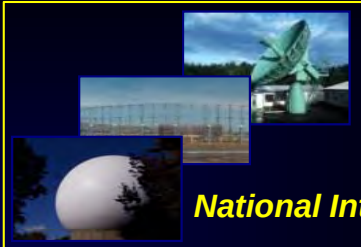
- Mission: Assured Information Dominance
- Vision: Securing the Global Information Grid
- Organization
  - 800+ personnel
  - Lackland AFB (San Antonio), Texas

CPSG Mission Areas

Crypto Modernization

Space Crypto

Air/Ground COMSEC Products



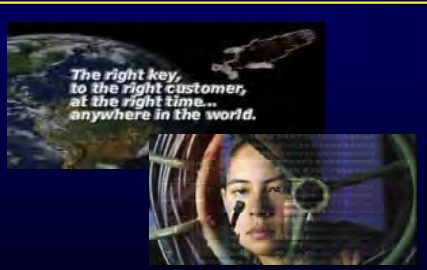
National Intel

Force Protection

Tech Apps

AF Electronic Key Infrastructure & Voice Call Signs

Public Key Infrastructure



Key Management Infrastructure

Global Information Grid Information Assurance

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AF SEAM Background[1]

- In 2006, AFMC Engineering Council Action
  - Provide an AF-wide SE Assessment Model
  - Involve AF Centers (product and logistics)
  - Leverage current CMMI®-based models in use at AF Centers
  - Baseline process capability & usage
  - Provide a single AF-wide tool which can be used for the assessment and improvement of systems engineering processes in a program/project

1 AF SEAM Orientation/Overview Briefing, ESC Integration Week, December 2008

AF SEAM Goals[2]

- Ensure a consistent understanding of SE
- Ensure core SE processes are in place and being practiced
- Document repeatable SE “best practices”across AF
- Identify opportunities for continuous improvement
- Clarify roles and responsibilities
- Improve program performance & reduce technical risk

2 AF SEAM Orientation/Overview Briefing, ESC Integration Week, December 2008

AF SEAM Benefits[3]

- Restoring Disciplined SE
  - Clear definition of expectations
  - Well aligned with policy
  - Established assessment
- Methods & Tools
  - Best practices baseline
  - Driving improvement
  - Moving towards deeper understanding of SE
- Processes
  - More efficient programs

3 AF SEAM Orientation/Overview Briefing, ESC Integration Week, December 2008

AF SEAM Content

- 10 Process Areas (PAs)
  - Specific goals/practices for each PA
    - 34 goals
    - 120 practices
  - Seven generic practices for each PA
  - Based on CMMI® process area constructs
- PAs
  - Configuration Mgmt
  - Decision Analysis
  - Design
  - Manufacturing
  - Project Planning
  - Requirements
  - Risk Mgmt
  - Sustainment
  - Tech Mgmt & Ctrl
  - Verification &Validation

Generic Practices

- Describe and maintain the process description
- Establish and maintain plans for performing the process
- Provide adequate resources for performing the process
- Assign responsibility and authority for performing the process
- Train the people who perform the process
- Monitor and control the process against the plan; take corrective action when needed
- Review the activities, status, and results with higher management and resolve issues

Specific Goals and Practices

Process Area	Goals	Practices
Configuration Mgmt	3	8
Decision Analysis	1	5
Design	3	14
Manufacturing	4	12
Project Planning	3	15
Requirements	4	13
Risk Mngt	3	7
Sustainment	4	15
Tech Mgmt & Control	4	15
V&V	5	16

Config Mngt - Example

- **CM Goal 1 (CMG1):The approach for technical baseline management is defined and documented**
  - **Practice 2 (CMG1P2): Establish and maintain plans for managing the configuration of the product**
    - **Description: Document plans and processes for technical baseline management. Describe how consistency between the product definition, the product's physical and functional configuration, and the CM records is achieved and maintained throughout the product's life cycle.**
    - **Typical Work Products:**
      - **Systems Engineering Plan**
      - **Configuration Management Plan**
    - **Reference material**
    - **Other considerations**

Config Mngt - Example

	C	D	E	F	G	H
16	AF SEAM Specific Practice ID	AF SEAM Specific Practice (SP)	Description	AF SEAM Typical Work Products or Equivalent	AF SEAM Other Considerations	AF SEAM References
19	CMG1P2	Establish and maintain plans for managing the configuration of the product.	Document plans and processes for technical baseline management in appropriate documents. Describe how consistency between the product definition, the product's physical and functional configuration, and the CM records is achieved and maintained throughout the product's life cycle.	▫ Systems Engineering Plan ▫ Configuration Management Plan	Consider the project's related needs for management of data and interfaces. Configuration management addresses obsolescence and technology refreshment. Change management process includes a checklist for all changes to be evaluated for impact to the OSS&E Baseline Document.	

Answer Yes/No/NA	Yes: Provide a concise explanation of how with No, NA: Provide explanation why not.	Title, version, date, and ideally a link for any associated work products developed.	Program/Project POC	Score (1/0/NA)

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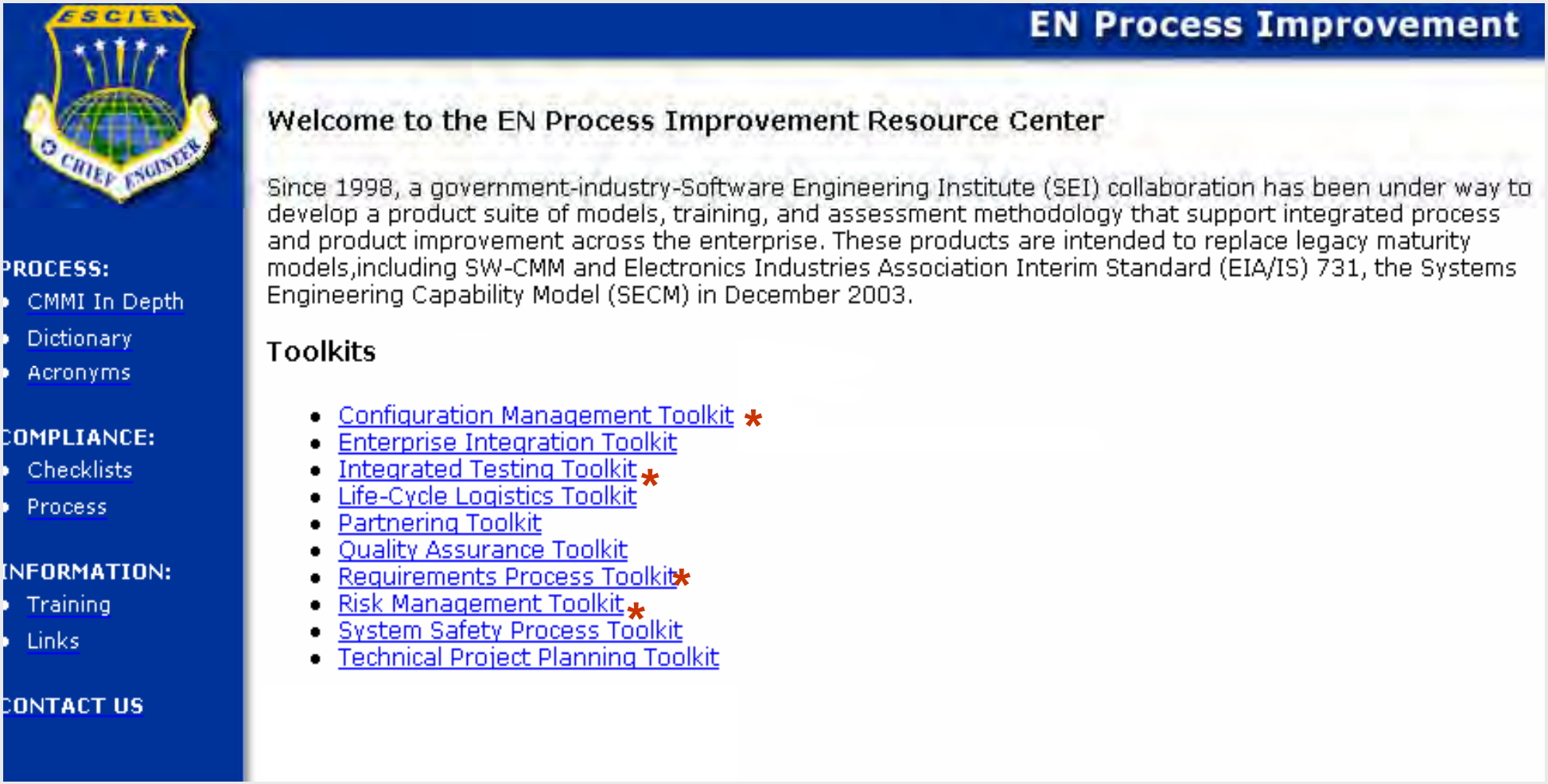
ESC Support -Toolkits



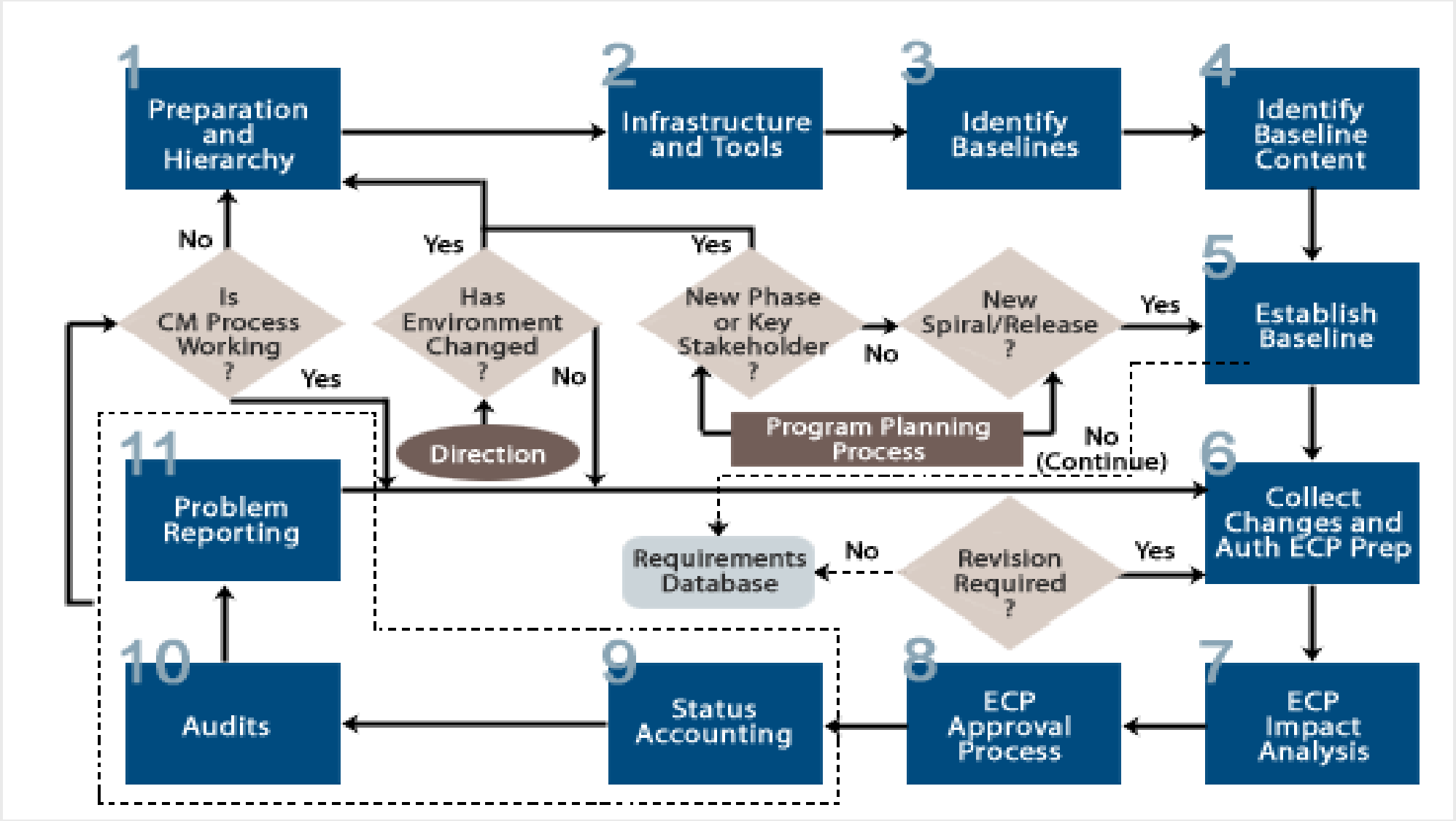
***CPSG Focus Areas**

ESC Toolkits - Contents

- Process Diagram
- Definitions
- Process Steps
  - Required
  - Optional
  - Suggested
- Tailoring Guidance
- Training
- Policies and References
- Tool Reviews
- Checklists
- Examples

ESC Toolkit

Configuration Management Process



ESC Tailoring Guidance

Required

The major steps are the goals of each process. All organizations are required to implement each process that achieves these goals.

Optional

The actions (e.g., 1a, 1b, etc) for each step are considered best practices and are expected to be performed by each organization to implement satisfactory processes. It is possible to satisfy the required goals without implementing the expected practices but the burden of proof is on the organization using an alternative set of practices.

Suggested

All material covered in the training sessions and resources provided in the toolkit are suggested approaches to implementing the expected practices. This material is optional and may be used at the discretion of the organization.

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CPSG Process Area Focus

- **Six Process Areas for Program Implementation**

  - **Life-Cycle Logistics**
  - **Technical Project Planning**

CPSG Implementation Guides

- **Implementation Guides**
  - **Contain the "How"**
  - **Allowable program tailoring identified**
  - **Templates provided for each process area**
  - **Provide Program Managers/Lead Engineers with an "80%" solution**
  - **Ensure consistency across CPSG**
  - **Example: Configuration Management Process**

CM Plan Development and Tailoring Guidance

4.1.5 Define Integration Points between Government and Contractor Configuration Management Processes

The Government CM Plan is used to communicate and coordinate with industry contractors involved in the program. It establishes interfacing processes and working relationships. Although tasking of CM is done via the Statement of Work (SOW) or Performance Work Statement (PWS), the Government CM Plan serves as the basis for these task orders.[2]

Implementation:	Identify Integration Points between government and contractor configuration management processes
References/Checklists:	CM Planning Checklist
Tailoring Guidance:	This is always required, but the actual structure is left to the program

Implementation Guide - Summary

Process Area	Major/ Minor Steps	Templates
Risk Mngt	8/36	– RM Plan – Risk Identification – Risk Mitigation
Config Mngt	10/30	– CM Plan – Config Control Board charters
Integrated Testing	8/44	– Test Evaluation Master Plan – Test Execution Strategy – ITT Charter – Test Report
Req Mngt	9/32	– Req Mngt Plan – Req Mngt Board charter

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Config Mngt Mapping

- Using the CPSG CM Implementation Guide

AF SEAM – CPSG Mapping	
AF SEAM	**CPSG CM Plan**
CMG1P1	• 6.1
CMG1P2	• 3.4 • 6.0 • 5.0
CMG2P1	• 5.1
CMG2P2	• 3.4 • 6.2 – 6.5 • 5.2
CMG2P3	• 3.4 • 6.4 • 6.1
CMG2P4	• 6.2 – 6.4 • 7.0
CMG3P1	• 3.4 • 7.0 • 6.2 – 6.4
CMG3P2	• 8.1

Risk Mngt Mapping

- **Using the CPSG Risk Mngt Implementation Guide**

AF SEAM – CPSG Mapping	
AF SEAM	**CPSG RM Plan**
RMG1P1	• 3.0 • 6.2
RMG1P2	• 6.3 – 6.4
RMG1P3	• 5.0 • 6.5 – 6.9
RMG2P1	• 3.1 • 6.5 – 6.6
RMG2P2	• 6.6 • Appendix B
RMG3P1	• 6.7
RMG3P2	• 6.6 – 6.9

Req Mngt Mapping

- **Using the CPSG Req Mngt Implementation Guide**

AF SEAM – CPSG Mapping		
AF SEAM	**CPSG Req Mngt Plan**	
RG1P1	• 3.2 • 4.2	• Appendix B • 4.4
RG1P2	• 4.1.1	• 4.1.2
RG1P3	• 4.1.2	• 5.1
RG1P4	• 5.0	• 3.4.3
RG2P1	• 4.2	
RG2P2	• 4.0	
RG3P1; RG3P2; RG3P3	• 3.3 • 4.4	• 4.1
RG4P1; RG4P2	• 3.3	• 4.0 - 5.0
RG4P3	• 3.4.1	• 3.4.3
RG4P4	• 3.3	• 5.0

Integrated Testing Mapping

- **Using the CPSG IT Implementation Guide**

AF SEAM – CPSG Mapping	
AF SEAM	**CPSG**
VG1P1	• Appendix A • Appendix D
VG1P2	• Attachment 1 (TEMP) • Appendix F (step c) •3.2(1) (TEMP) • 4.3(1) (TEMP) •6.1(1) (TEMP)
VG1P3	•1.2 (2) (TEMP) • 3.2(1) (TEMP) • 4.3(1) (TEMP) • 5.2 (TEMP) •6.1(1) – 6.1(3) (TEMP)
VG1P4	•Appendix F • 3.2(3) (TEMP) •4.3(3) (TEMP)
VG2P1	•3.2.1 (ITT Charter) • 3.2.7 (ITT Charter) •4.1.3 (Implementation Guide)
VG2P2	• ITT Charter
VG3P1	• Appendix F • Appendix G Part IV • 8.1.1 (CM Plan)

Integrated Testing Mapping

♦ Using the CPSG IT Implementation Guide

AF SEAM – CPSG Mapping		
AF SEAM	**CPSG**	
VG3P2	• Appendix F	• Appendix G Part IV
VG3P3	• Appendix G Part III	
VG4P1 VG4P2	• Appendix F • Attachment 2 (TEMP) • 4.3(3) (TEMP)	• Attachment 1 (TEMP) • 3.2(3) (TEMP) • 6.1 (TEMP)
VG4P3	• 4.1.7 (Implementation Guide)	• 6.0 (TEMP)
VG4P4	• 5.0 (TEMP)	
VG4P5	• 4.4 (TEMP)	• 6.1(2) – 6.1(8) (TEMP)
VG5P1	• 5.1 (TES) • Appendix F	• 2.1 (TEMP)
VG5P2	• 4.2 (Implementation Guide) • 6.0 (Implementation Guide)	• Appendix G

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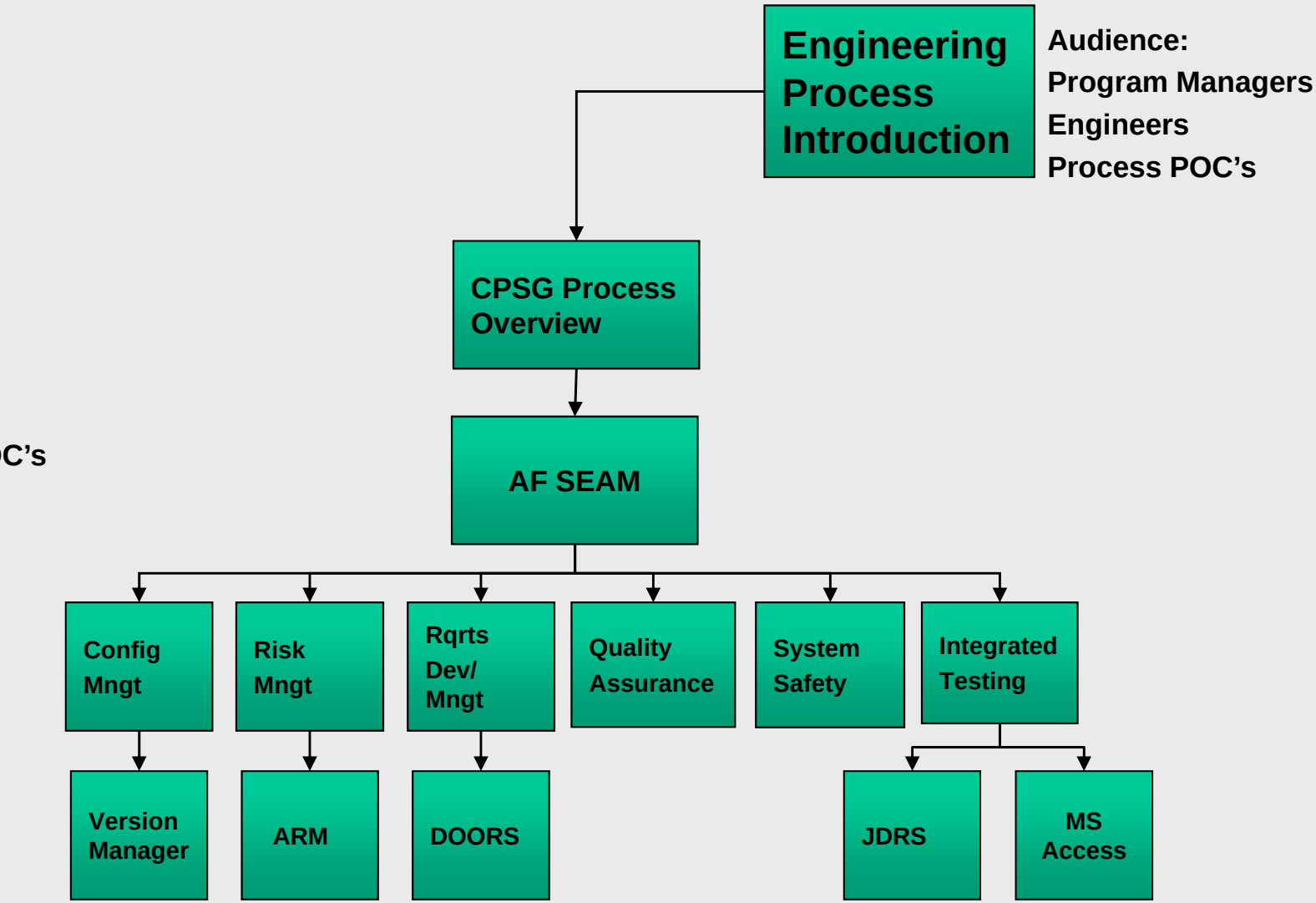
Training Plan



References and Contacts

- AFI 63-1201, Lifecycle Systems Engineering
- AFMCI 63-1201, Implementing Operational Safety Suitability and Effectiveness and Life Cycle Systems Engineering
- AF SEAM Guide: https://enweb.mitre.org/wiki/images/5/5d/AF_SEAM_Management_Guide_v1_31Jul08.doc
- CM Guide: https://enweb.mitre.org/wiki/index.php/Configuration_Management
- MITRE Transfer folder or Contact me
  - IT Guide
  - Risk Guide
  - Req Guide
  - Process training
  - Tool training

Wrap-up

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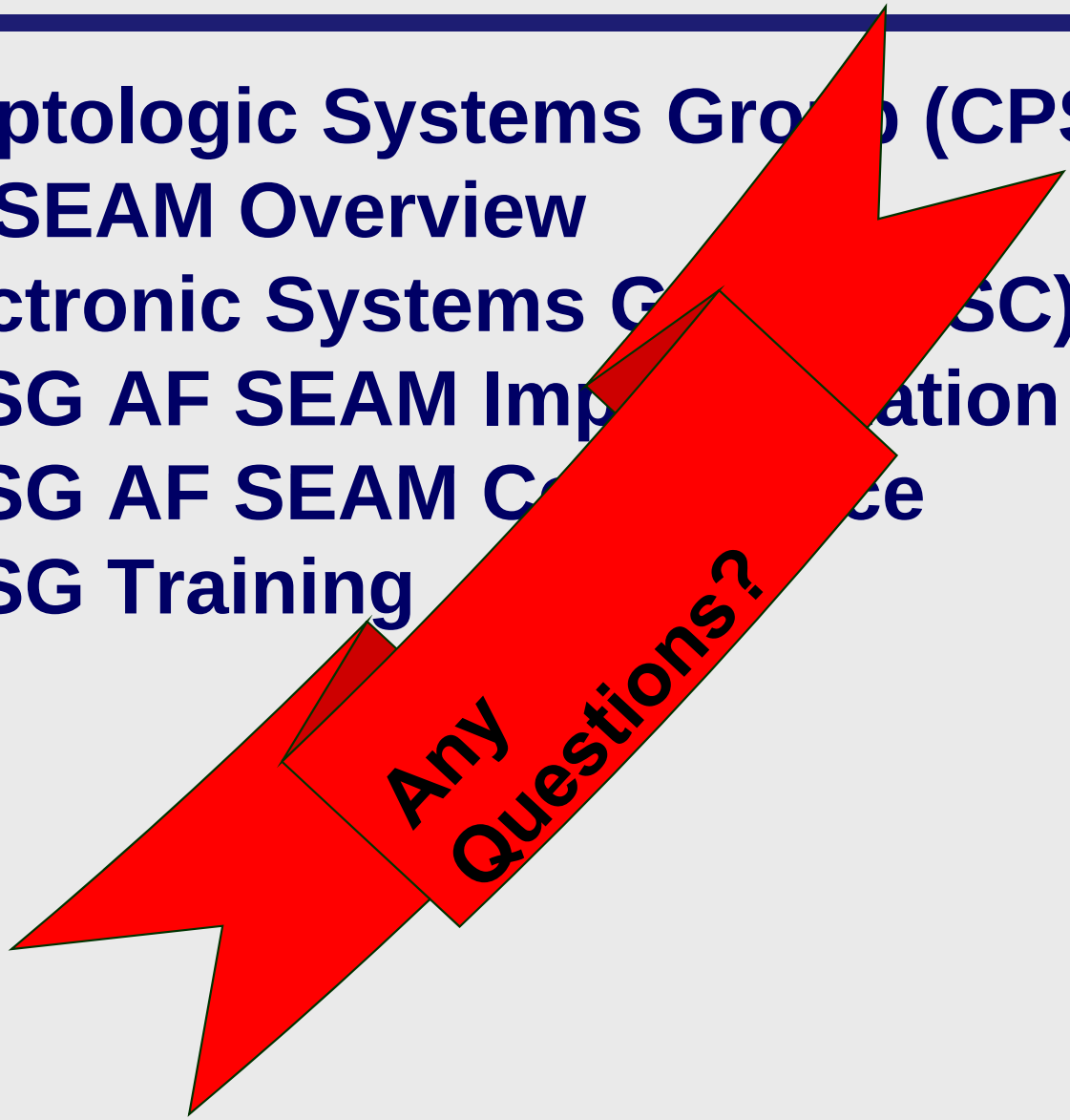

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